4.2 BLANKET WASH COST ANALYSIS METHODOLOGY

The methodology described below was used to estimate the cost of using the baseline blanket wash as well as the cost of using 22 substitute blanket washes. The primary source of information for the cost estimates was the performance demonstration conducted during production runs at 17 volunteer facilities in late 1994 and early 1995 and described in section 4.1. This information was supplemented by several other sources, including: 1) industry statistics collected by trade groups such as NAPL; 2) lease prices for cloth printer's wipes from a large east coast industrial laundry; and 3) EPA's risk assessment work presented in chapter 3.

The performance demonstration collected data on the use of donated, substitute blanket wash products and the baseline, VM&P Naphtha. Substitute products were screened for blanket swell and washability; each was then sent to two printing facilities. Each facility also tested the baseline product; results are presented comparing the substitute products to the baseline. Although each facility was to use the substitute product for one week, performance problems and scheduling conflicts resulted in some products being used more than others. Section 4.1.4 provides a discussion of the limitations of the demonstration. Table 4-2 in the previous section summarizes the results.

Certain assumptions were used in this analysis to smooth out the differences among the various facilities participating in the performance demonstration in order to make the results comparable and to remain consistent with assumptions used in other parts of this CTSA. For example, it was assumed that there are four blankets or "units" per press, each of which is washed 10 times per shift. Additionally, it was assumed that work is performed for one 8-hour shift per day, 5 days per week, 50 weeks per year. Using these assumptions, the following costs were estimated for individual facilities involved in the performance demonstrations for the baseline blanket wash and each substitute blanket wash:

- Total cost/wash,
- Total cost/press, and
- Total cost/press/shift/year.

A general description of the cost estimation methodology and data sources used is presented in Section 4.2.1 below. Section 4.2.2 provides a more detailed description of the methodology. Section 4.2.3 provides an example of the calculations described in Sections 4.2.1 and 4.2.2.

4.2.1 General Description of Costing Methodology

In general, the cost estimate for each reclamation method combines product cost and product performance data. Variations in the sample sizes, the value for 'n', found in the labor rate (time), the number of wipes per cleaning, quantity of wash used and number of cleanings used to determine performance are due to differences in the way the data for each factor was collected. For example, in the case of the time required to clean the blanket, only the data collected by the observer on the first day of the demonstration were used in the assessment. In determining the average quantity of blanket wash used, data collected during the entire week were utilized in the assessment resulting in a higher sample size. The final cost estimates are a combination of the three distinct cost elements listed below:

Labor

The time spent to clean the blanket was recorded in the performance demonstrations by the observer on the first day of the demonstration for each product, as it was not feasible for press operators to time themselves while cleaning. Therefore, estimates of time to clean the blanket

recorded by observers were used to calculate the labor cost.[a] The labor cost was calculated as the total time spent multiplied by 1) the average wage rate for lithography press operators of $15.52/hour, 2) an industry fringe rate (to account for holiday and vacation) of 1.07, and 3) an industry multiplier of 1.99 to account for overhead costs. All of these cost elements were calculated from industry statistics reported in NAPL's *1993 Cost Study* and are explained in more detail in Section 4.2.2.

Cost Methodology Information Basis Summary

Labor
- Observer time from demonstration
- Wage rate - $15.52/hr
- Fringe rate multiplier - 1.07
- Overhead rate multiplier - 1.99

Blanket Wash
- Recorded quantity used during demonstration
- Adjusted for dilution
- Product cost provided by supplier

Materials - Wipes
- Recorded quantity used during demonstration
- Lease price - $0.11/wipe

Blanket wash products

The quantity of blanket wash used per blanket was recorded during the observer's visit and by the press operator during the week of demonstrations. Average usage per blanket was calculated at each facility for both the baseline product and the 22 substitute products. Multiplying usage per wash, accounting for dilution where necessary, by the unit cost of each product (provided by each participating manufacturer and summarized in Table 4-3) yielded the blanket wash costs.

Materials (i.e., wipes)

The only materials consumed in manual blanket washing are the wipes used by the press operator to wash the blanket. All but one of the print shops participating in the performance demonstration used cloth wipes; the other used disposable wipes. Materials costs were therefore calculated by multiplying the number of wipes used, as recorded in the performance demonstrations, by the lease price of a cloth printer's wipe. (A representative of Standard Uniform Services, one of the largest industrial laundries in Massachusetts, provided an estimated lease price of $0.11 per wipe.)

[a] *An alternative method of determining the labor time was examined, apart from using the average time estimates compiled by observers. Within each facility, observers and press operators collected data on the number of blanket rotations per wash. Because only observers compiled time estimates, the rotations data included more observations and was, therefore, considered as an alternative method for estimating labor time. However, this approach was abandoned after further analysis found poor correlation between time and number of rotations. Although occasionally high correlation was found to exist, the majority of facilities did not show a high degree of correlation. Eight facilities with the greatest number of observations were analyzed separately to determine if time and number of rotations were correlated. Again, poor correlation was found. This is interpreted to mean that there was not a preset cleaning speed for the rotation of the cylinders; we were not, therefore, able to use the number of rotations multiplied by the average time per rotation recorded by the observer to determine the labor time involved with cleaning the cylinders. In addition, the ink coverage changed from one cleaning to the next, adding a variation which affected the cleaning time. However, poor correlation between time and number of rotations was also found to exist for facilities that reported consistent ink coverage.*

The trend in the number of rotations necessary to clean a cylinder was also examined to determine if there was a learning curve involved with using the alternative cleaners. While it is believed that there is a learning curve, the demonstration timetable was too short for this observation, which was further complicated by variable ink coverage.

A summary of the cost comparisons is presented in Table 4-4, followed by a graphical display (Figure 4.1) of the relative cost changes (substitute compared to baseline) at each facility.[b] Figure 4.1 illustrates the range of percentage cost changes (compared to the baseline) measured at each facility. Two points are plotted for each of the substitute products because each was tested at two facilities. Formulations are arranged by ascending VOC content. Cost comparisons for each blanket wash against the baseline are provided at the end of this section; summary paragraphs are followed by tables providing specific results. Absolute and relative cost variations are reported for each substitute. An increase in the time required to clean the blanket, quantity of wash solution used, number of wipes expended, and costs of labor and materials is preceded by a plus sign; conversely, decreases are denoted by a minus sign.

Table 4-3. Substitute Blanket Washes, Manufacturer Pricing

Blanket Wash Number and Type	Product Cost per Gallon ($)** (based on the 55 gallon drum price)($)
Baseline - VM&P Naphtha	5.88
1 - Vegetable Fatty Ester	20.00
6 - Ester/Petroleum + Surfactant	12.35
9 - Ester/Water	10.26
10 - Ester/Water	9.55
11 - Ester/Petroleum + Surfactant	12.15
12 - Petroleum/Water Diluted for Use	16.40
14 - Vegetable Fatty Ester + Glycol	9.55
19 - Vegetable Fatty Ester + Glycol	11.80
20 - Petroleum/Water	10.80
21 - Ester/Petroleum	10.08
22 - Water/Petroleum/Ester	13.15
24 - Terpene	17.85
26 - Vegetable Fatty Ester	12.24
29 - Vegetable Fatty Ester	18.00
30 - Petroleum/Water Diluted for Use	5.00
31 - Petroleum	9.80
32 - Petroleum	2.85
34 - Water/Petroleum/Ester	15.00
37 - Petroleum/Water	14.80
38 - Ester/Petroleum	19.00
39 - Petroleum/Water	8.95
40 - Ester/Petroleum + Surfactant	10.25

** Unit costs supplied by manufacturers participating in the performance demonstrations.

[b]*Products 9, 22, and 32 are not included within Figure 4.1 because VOC content for these products was not available.*

Table 4-4. Summary of Cost Analysis for Blanket Wash Performance Demonstration

Formula Number	Test Facility	Total cost/wash		Total cost/press		Total cost/press/shift/year		Percentage Difference[1]
		Baseline	Alternative	Baseline	Alternative	Baseline	Alternative	
1	Facility 3	0.55	0.69	2.20	2.76	5,500	6,900	+25
	Facility 6	0.46	0.87	1.84	3.48	4,600	8,700	+89
6	Facility 11	0.70	0.82	2.80	3.28	7,000	8,200	+17
	Facility 15	0.50	0.77	2.00	3.08	5,000	7,700	+54
9	Facility 10	0.91	2.08	3.64	8.32	9,100	20,800	+129
	Facility 15	0.50	0.92	2.00	3.68	5,000	9,200	+84
10	Facility 3	0.55	0.57	2.20	2.28	5,500	5,700	+4
	Facility 4	0.85	2.20	3.40	8.80	8,500	22,000	+159
11	Facility 1	0.59	1.29	2.36	5.16	5,900	12,900	+119
	Facility 2	0.53	0.68	2.12	2.72	5,300	6,800	+28
12	Facility 12	0.81	0.99	3.24	3.96	8,100	9,900	+22
	Facility 13	0.80	0.83	3.20	3.32	8,000	8,300	+4
14	Facility 6	0.46	1.07	1.84	4.28	4,600	10,700	+133
	Facility 16	0.66	0.82	2.64	3.28	6,600	8,200	+24
19	Facility 18	0.62	1.66	2.48	6.64	6,200	16,600	+168
	Facility 19	0.53	0.89	2.12	3.56	5,300	8,900	+68
20	Facility 11	0.70	1.13	2.80	4.52	7,000	11,300	+61
	Facility 12	0.81	1.58	3.24	6.32	8,100	15,800	+95

Formula Number	Test Facility	Total cost/wash		Total cost/press		Total cost/press/shift/year		Percentage Difference[1]
		Baseline	Alternative	Baseline	Alternative	Baseline	Alternative	
21	Facility 6	0.46	1.01	1.84	4.04	4,600	10,100	+120
	Facility 17	0.41	0.58	1.64	2.32	4,100	5,800	+41
22	Facility 12	0.81	0.82	3.24	3.28	8,100	8,200	+1
	Facility 13	0.80	1.51	3.20	6.04	8,000	15,100	+89
24	Facility 16	0.66	0.97	2.64	3.88	6,600	9,700	+47
	Facility 17	0.41	0.88	1.64	3.52	4,100	8,800	+115
26	Facility 5	0.55	0.73	2.20	2.92	5,500	7,300	+33
	Facility 15	0.50	0.47	2.00	1.88	5,000	4,700	-6
29	Facility 7	0.57	0.93	2.28	3.72	5,700	9,300	+63
	Facility 8	0.55	0.89	2.20	3.56	5,500	8,900	+62
30	Facility 18	0.62	1.01	2.48	4.04	6,200	10,100	+63
	Facility 19	0.53	0.62	2.12	2.48	5,300	6,200	+17
31	Facility 7	0.57	1.59	2.28	6.36	5,700	15,900	+179
	Facility 8	0.55	0.59	2.20	2.36	5,500	5,900	+7
32	Facility 1	0.59	1.31	2.36	5.24	5,900	13,100	+122
	Facility 5	0.53	0.43	2.12	1.72	5,300	4,300	-19
34	Facility 1	0.59	0.89	2.36	3.56	5,900	8,900	+51
	Facility 19	0.53	0.95	2.12	3.80	5,300	9,500	+79

Formula Number	Test Facility	Total cost/wash		Total cost/press		Total cost/press/shift/year		Percentage Difference[1]
		Baseline	Alternative	Baseline	Alternative	Baseline	Alternative	
37	Facility 3	0.55	0.48	2.20	1.92	5,500	4,800	-13
	Facility 4	0.85	0.79	3.40	3.16	8,500	7,900	-7
38	Facility 2	0.53	1.08	2.12	4.32	5,300	10,800	+104
	Facility 4	0.85	1.11	3.40	4.44	8,500	11,100	+31
39	Facility 5	0.55	0.69	2.20	2.76	5,500	6,900	+25
	Facility 8	0.55	0.80	2.20	3.20	5,500	8,000	+45
40	Facility 1	0.59	0.79	2.36	3.16	5,900	7,900	+34
	Facility 10	0.91	0.87	3.64	3.48	9,100	8,700	-4

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the cost when using the alternative blanket cleaner instead of the base product.

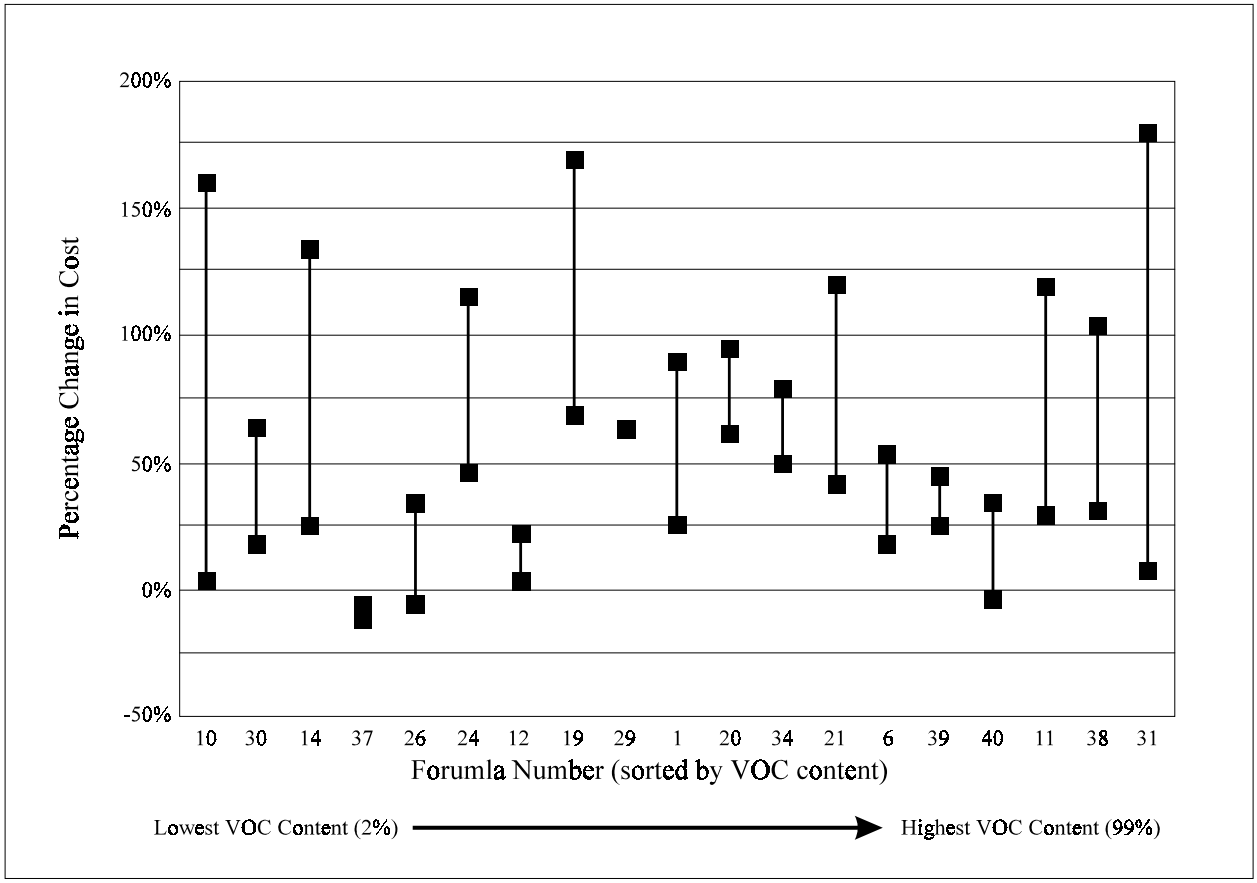


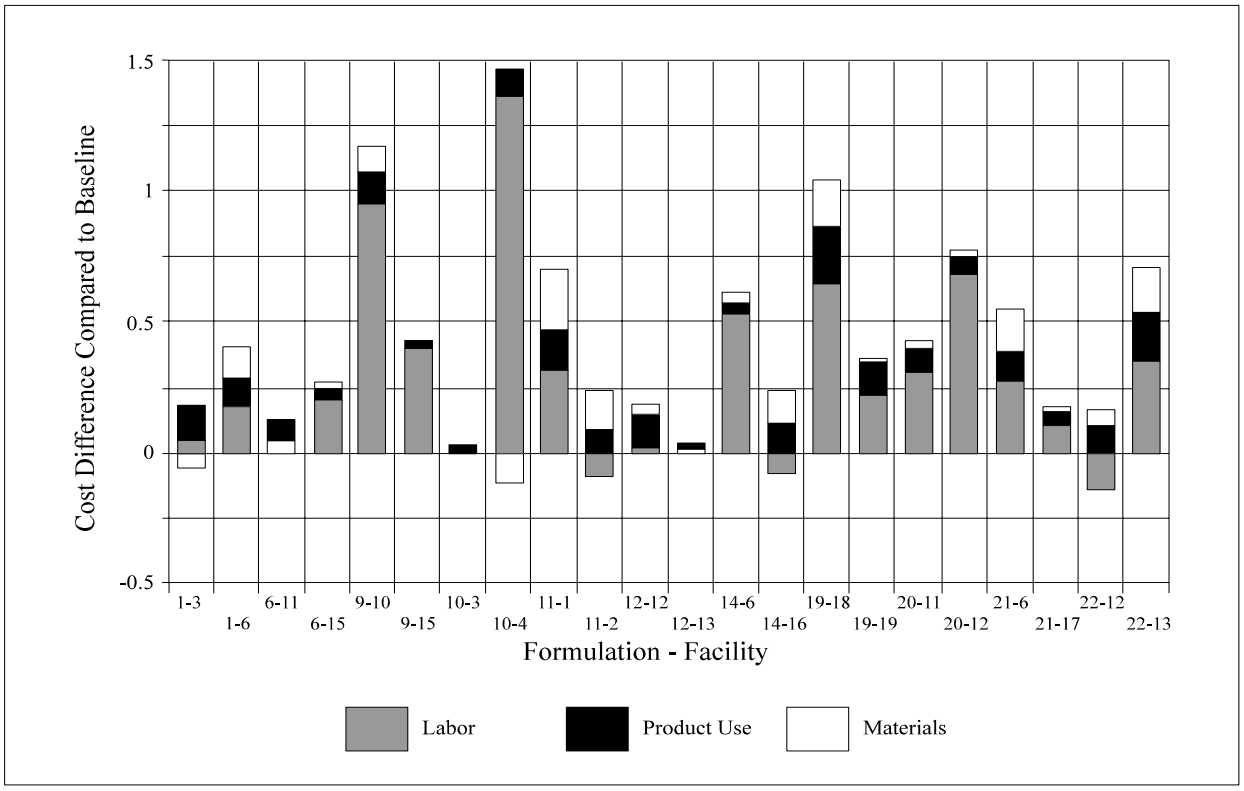
Figure 4.1 Blanket Wash Costs Changes Arranged by Lowest to Highest VOC Content of Formulations

4.2.2 Details Related to Data Sources and Methodological Approach

As mentioned above, the blanket wash cost comparison considered three cost elements when comparing the performance of baseline and substitute blanket cleaners: labor costs (time × wage rate); blanket wash use (quantity × unit price), adjusting for dilution; and material and equipment costs (# wipes × cost per wipe). Each element is described in more detail below. Also, Figure 4.2 presents a graphical display of the relative contribution of labor, product use, and material use to the overall cost differences (compared to the baseline) for each of the substitute products. For example, performance results for product 1, tested at facility 6 indicate that overall costs per wash were $0.41 greater for Blanket Wash 6 compared to the baseline. The $0.41 difference is divided up as follows: costs associated with labor were $0.19 higher than the baseline, costs associated with product use (i.e., price x quantity) were $0.11 greater than the baseline, and costs associated with material and equipment use were $0.11 greater than the baseline.

Labor Costs

The hourly wage and overhead rate for press operators was calculated from the *NAPL 1993 Cost Study*. The NAPL study presents a number of facility-specific characteristics, including



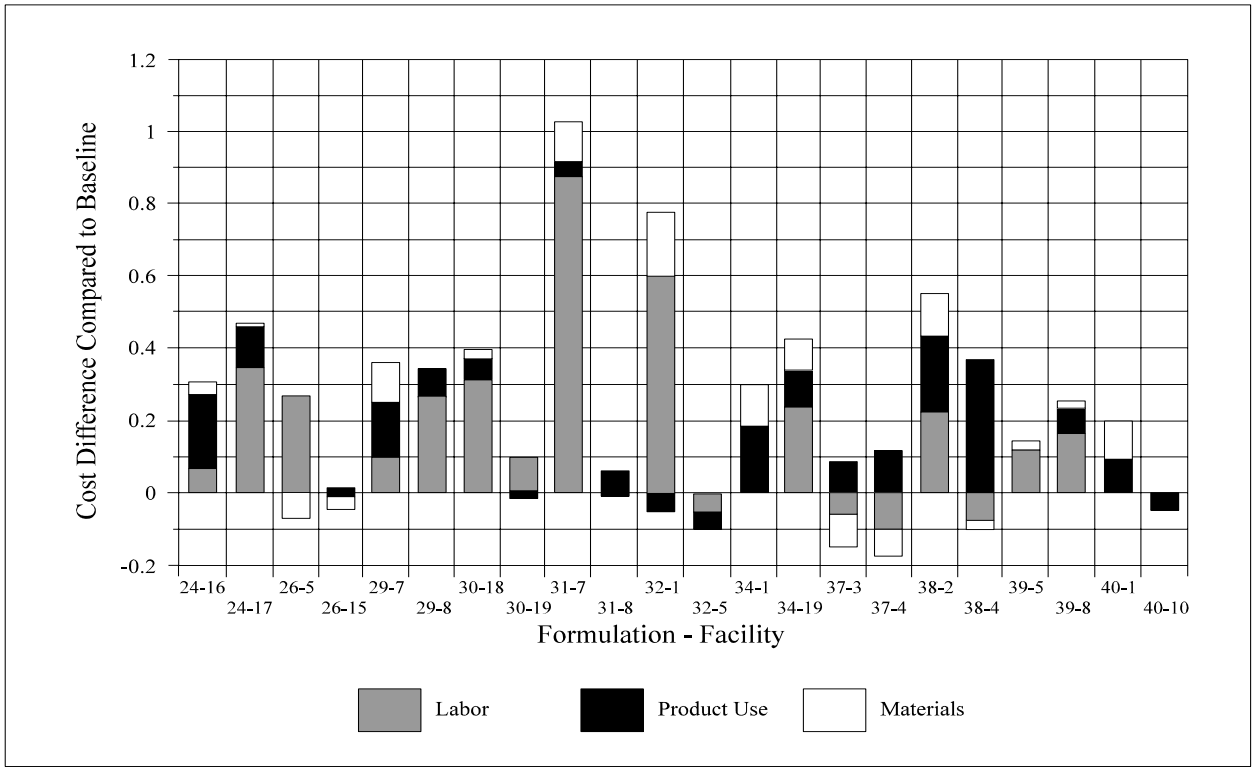


Figure 4.2 Cost Difference Between Substitute and Baseline Blanket Washes

annual wages and overhead costs by press type and brand, number of shifts per day, length of work week, and vacations and holidays allowed. Because of the many variables impacting hourly wages and overhead rates, several assumptions were made to facilitate comparisons along the various alternatives.

Assumptions

- Based on a review of press sizes used in the performance demonstrations as well as discussions with performance demonstration observers, wage rates and overhead expenses for a 26-inch, 2-unit press were used in this analysis.

- The *NAPL 1993 Cost Study* presents three possible employment scenarios (referred to as areas A, B, and C), each with differing wages and overhead costs. The "areas" are defined as follows: 1) area A: 35 hours/week, 4 weeks paid vacation, and 11 paid holidays; 2) area B: 37.5 hours/week, 3 weeks paid vacation, and 10 paid holidays; and 3) area C: 40 hours/week, 2 weeks paid vacation, and 8 paid holidays. It was assumed that press operations at performance demonstrations shops operate under a 40 hour work week and are offered 2 weeks paid vacation and 8 paid holidays per year.

- Annual wages and overhead rates vary according to the number of (eight hour) shifts the press facility operates per day. As the number of shifts increase, the wage rate for all shifts increases and the overhead rate decreases. To estimate average wage and overhead rates for this analysis, hourly wage estimates and overhead rates were weighted according to the proportion of facilities participating in performance demonstrations operating one, two or three shifts per day.

- The NAPL cost study provides overhead expenses for seven brands of presses within the 26-inch, 2-unit press category. Overhead rates were calculated by averaging across the seven brands. Annual wages do not vary across the seven brands of presses.

Hourly wage rate for a press operator

As mentioned above, annual wage rates, presented in the NAPL cost study, do not vary across press type; however, wages do vary according to the number of shifts operated per day. In this analysis, a weighted average of $15.52/hour was calculated given that nine of the facilities that participated in the performance demonstration operate one shift per day, four facilities operate two shifts per day, and four facilities operate three shifts per day. Calculations of the average hourly wage are presented in Table 4-5 below.

Table 4-5. Calculation of Average Hourly Rate

# Shifts (8 hrs.)	Annual Wage	Hourly Wage	Weight (Facilities × shifts)	Wage × Weight
1	$31,200	$15.00	9	$135
2	$64,740	$15.56	8	$124
3	$99,060	$15.88	12	$191
Totals:			29	$450
Total wage × weight:				$450.04
Total/29:				**$15.52**
Source: NAPL 1993 Cost Study				

Fringe rate

To account for costs associated with fringe benefits such as holiday and vacation time, a fringe rate was calculated. The NAPL Cost Study indicates that press operators working a 40 hour week receive eight paid holidays and two weeks vacation per year. To calculate the fringe rate, non-productive hours were subtracted from total hours of operation per year (i.e., 2,080 hours minus 144 hours = 1936 hours). The ratio of total hours to productive hours is equal to the fringe rate applied to each hour worked (2080/1936 = 1.074).

Overhead rate

Overhead rates for this analysis are calculated according to the following formula[c]:

$$\frac{\text{depreciation + rent \& heat + fire \& sprinkler insurance + pension fund + welfare benefits + payroll taxes + workmen's comp. + light \& power + direct supplies + repairs to equipment + general factory + administrative \& selling overhead}}{\text{direct labor + supervisory and misc. labor}}$$

The NAPL cost study provides overhead expenses for seven brands of presses within the 26-inch, 2-unit press category. For the purposes of this analysis, overhead rates were averaged across the seven brands. As with the hourly wage calculations, a weighted average was calculated, accounting for the variability in the number of shifts a facility may operate per day. The overhead rate was estimated to be 1.99.

Total Labor Cost

The total labor cost associated with the use of an individual blanket wash was calculated by multiplying the average cleaning time by the press operator's hourly wage, overhead rate, and fringe rate. For example, the total labor cost for Blanket Wash 1, tested by facility 3, was calculated by multiplying the average time spent cleaning (37.5 seconds) by the wage per second ($15.52/60min/60sec[d]), overhead rate (1.99), and fringe rate (1.074) for a total cost of $0.35 per wash.

Blanket Wash Use

Costs attributable to blanket wash use were calculated by multiplying the average quantity of blanket cleaner used per wash cycle by the price of the appropriate wash. In cases where participants diluted blanket wash with water, the unit price was multiplied by the ratio of cleaner used and not the total quantity of the mixture. For example, if the dilution ratio was 1:1, the unit price of the blanket wash was multiplied by 0.5 to account for dilution and then multiplied by the volume used. As mentioned above, blanket wash prices were provided by manufacturers participating in the performance demonstrations. During the performance demonstrations it was observed that most printing facilities purchased blanket cleaner in 55-gallon quantities. This was assumed to be true of all printing facilities participating in the performance demonstration.

Material and Equipment Costs

Because the performance demonstrations were limited to manual blanket washing, the only materials or equipment affecting the cost of blanket washing were the wipes used by the press operator to remove ink and paper products. The cost of press wipes were calculated by multiplying

[c] *Overhead cost elements were taken directly from the NAPL 1993 Cost Study.*

[d] *The wage rate of $15.52 per hour translates to $0.0043 per second.*

the average number of wipes used per wash by the lease price of a cloth printer's wipe. A representative of Standard Uniform Services, one of the largest industrial laundries in Massachusetts, estimated a lease price of $0.11 per wipe.

Waste Disposal

Because blanket washing wastes may be classified as hazardous wastes by regulations implementing RCRA and therefore require more careful and costly handling and disposal, printers may reduce waste disposal costs if wastes associated with alternative blanket washes do not contain any RCRA listed wastes, eliminating the need to be handled as hazardous waste.[e] Disposal costs were not considered in this cost comparison, however, because all but one of the printers participating in the performance demonstrations use cloth wipes that are leased from an industrial laundry. Industrial laundries currently do not distinguish between hazardous and nonhazardous blanket washes when laundering wipes; it was therefore assumed that there would be no savings in waste handling or processing costs associated with switching to an alternative blanket wash product. In addition, the impact of alternative cleaners on the costs of handling and processing used wipes is unclear. For example, according to the Uniform and Textile Service Association, wipes impregnated with vegetable-oil based cleaners have a higher potential for spontaneous combustion when piled together in a laundry bag. Vegetable-oil based cleaners break down, creating exothermic heat and the potential for spontaneous combustion. In addition, the vegetable oil-based cleaners may make wastewater treatment and permit compliance more difficult for the industrial laundry (Dunlap, 1995).

While there is a potential for reduction in waste treatment and disposal costs attributed to the use of alternative blanket cleaners, the current state of federal regulations is in flux. Also, there are many different state and local regulations which might dictate different treatment for hazardous blanket wash wastes. Specifically, future changes to RCRA and the Clean Water Act (CWA) could potentially create a cost advantage for printers using alternative blanket cleaners. Currently, under RCRA, the mixture rule classifies a non-hazardous waste as hazardous when combined with a listed waste (F, P, K, and U listed wastes). The mixture rule was struck down by a 1991 District of Columbia Circuit Court ruling, but was temporarily reenacted while EPA conducts a review of the rule. EPA has not provided definitive guidance on the treatment of solvent contaminated shop towels, leaving it to each state to provide guidance on the identification and management of press wipes.[f] Many states have responded by recognizing a conditional exemption from the mixture rule for contaminated press wipes. EPA's Office of Solid Waste is currently considering changes to the definition of hazardous and solid wastes that could potentially exempt press wipes from hazardous waste classification. Also, EPA is currently developing categorical standards for the industrial laundry industry that could potentially impact the cost of treating press wipes.

The results of the cost comparisons are presented in section 4.2.4 in both cost summary tables and descriptive paragraphs (for each of the 22 field tested blanket washes). As indicated in the tables, presses of three *standard* sizes were used in the performance demonstrations:

- 19" × 26" -- also recorded by printers as 18" × 25", 19" x 25", 19" x 28", and 20" x 26";
- 11" × 17" -- also recorded by printers as 13" × 18", and 12" × 18"; and
- 40" × 28" -- also recorded by printers as 40" × 34."

[e] *Costs of managing hazardous wastes include placing the waste in a closed and properly labeled container, manifesting shipments and using special shipping arrangements, and shipping to a permitted hazardous waste treatment or disposal facility.*

[f] *The EPA is planning to develop guidance to the States for the use, reuse, transportation, and disposal of shop towels.*

Additionally, ink coverage is reported in the tables as the *average* ink coverage observed on the blanket throughout the demonstrations. Coverage is reported as light, light-medium, medium, medium-heavy, and heavy. Cost savings or increases (absolute and percent differences) associated with using each of the alternatives as compared to the baseline (VM&P Naphtha) are indicated for each facility. A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

4.2.3 Example Calculation

As an example of the cost calculations presented in the cost summary tables, the calculations for alternative Blanket Wash 1, tested by facility 3, are described in full. Total labor cost was calculated by multiplying the average time spent cleaning (37.5 seconds) by the wage per second ($15.52/60min./60sec.), overhead rate (1.99), and fringe rate (1.074) for a total cost of $0.35 per wash. The cost associated with blanket wash use was calculated by multiplying the average quantity used per wash (1.04 ounces or 8.13×10^{-3} gallons) by the unit price of Blanket Wash 1 ($20.00/gallon) for a total cost of $0.16 per wash. The material cost was calculated by multiplying the average number of wipes used per wash (1.6 wipes) by the estimated lease cost per wipe ($0.11/wipe). The total cost per wash for Blanket Wash 1 ($0.69) is simply the sum of the labor, blanket wash, and material costs and is presented at the bottom of the cost summary table for Blanket Wash 1.

Labor Cost
=average cleaning time/wash × wage rate × overhead rate × fringe rate
=37.5 sec × ($15.52/hr × 1hr/60min × 1min/60sec) × 1.99 × 1.074
=$0.35 per wash

Blanket Wash Cost
=average quantity used/wash × unit price of blanket wash
=(8.13×10^{-3} gallons) × $20.00/gallon
=$0.16 per wash

Material Cost
=average number of wipes used/wash × lease cost/wipe
=1.6 wipes × $0.11/wipe
=$0.18 per wash

Total Cost per Wash
=labor cost + blanket wash cost + material cost
=$0.35 + $0.16 + $0.18
=$0.69 per wash

Also presented at the bottom of each table are estimates of total cost per press and total annual costs. The total cost per press ($2.76) for Blanket Wash 1, tested at facility 3, is calculated by multiplying the total cost per wash ($0.69) by the estimated number of blankets per press (4 blankets). The total annual cost ($6,900) is calculated by multiplying the total cost per press ($2.76) by the number of washes per shift (10 washes), the number of shifts per week (5 shifts), and the number of weeks worked per year (50 weeks):

Total Cost per Press

=cost/wash × estimated number of blankets/press
=$0.69 × 4 blankets
=$2.76

Total Annual Cost

=total cost/press × number of washes/shift × number of shifts/week × number of weeks/year
=$2.76/press × 10 washes/shift × 5 shifts/week × 50 weeks/year
=$6,900

Costs of using the baseline product were calculated according to the same procedure used for the alternative blanket washes. The absolute and percentage difference between the costs of the baseline product and Blanket Wash 1 are presented in the cost summary table for Blanket Wash 1. For example, the absolute difference between the labor cost for the baseline product and Blanket Wash 1 is +$0.07 ($0.35 minus $0.28). The positive sign indicates an increased labor cost when using Blanket Wash 1 instead of the baseline (VM&P Naphtha). Labor costs associated with the use of Blanket Wash 1 increase 25% based upon the experience of facility 3. In contrast, the cost associated with material and equipment use for Blanket Wash 1 decreased by four cents or 18%.

4.2.4 Blanket Wash Cost Analysis Results

The results of the cost analysis are summarized in the following paragraphs and tables. It is important to keep in mind several factors when reviewing these results. First, they are based almost entirely on the results of the performance demonstration. For each individual product, the performance demonstrations were subjective assessments reflecting the conditions and experiences of two individual print shops, not scientifically rigorous evaluations. As such, the information derived from the demonstrations are illustrative and are not necessarily reflective of the actual experience of using the various products at a particular facility. The two facilities which tested each product often had very different experiences. As described in the introduction to Section 4.1 - Performance Demonstration, reasons for these differences included variability in operating conditions, type of print jobs, staff involvement, and application method.

The cost factors considered in this analysis were the cost of labor, the cost of the blanket wash, and the cost of the wipes. Among these three factors, the driving factor was the cost of labor, which, on average, contributed 63% of the overall cost of washing the blanket. The time spent to clean the blanket was recorded in the performance demonstrations by the observer on the first day of the demonstration for each product on the first few uses of the substitute. With continued use, the time necessary to clean the blanket may be reduced because of the press operator's familiarity with the substitute product. The wipes contributed, on average, 21% and the blanket wash, on average, 16% of the cost. There were some instances were the cost of the blanket wash was the largest contributor, but there were no instances where consistently the cost of a particular product outweighed the cost of labor or where this trend was seen for a particular facility.

Comparisons of each alternative blanket wash product with the baseline blanket wash, VM&P Naphtha (Blanket Wash 28), for each facility are summarized in the paragraphs below and in more detail in the tables which follow. Absolute and relative cost variations are reported for each alternative. An increase in the time required to clean the blanket, quantity of wash solution used, number of wipes expended, and costs of labor and materials is preceded by a plus sign; conversely, decreases are denoted by a minus sign.

Substitute Blanket Wash 1

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 1 instead of the baseline product at both facilities 3 and 6. Press operators commented that cleaning and drying times were excessive, as reflected in the performance data; performance results indicate a 25 percent increase and a 70 percent increase in cleaning times at facilities 3 and 6, respectively. The costs associated with product use (i.e., volume x price) are also significantly higher for Blanket Wash 1 when compared to the baseline, driven primarily by the product's high price. The manufacturer's price for product 1 is $20/gallon versus $5.88/gallon for the baseline product. Costs associated with product use increased roughly 220 percent and 160 percent for facilities 3 and 6, respectively. Facility 6 did not use alternative product 1 for the full week-long demonstration, discontinuing use after experiencing print quality problems believed to have been attributable to use of the alternative product.

Substitute Blanket Wash 6

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 6 instead of the baseline. Costs for facilities 11 and 15 increased roughly 20 percent and 50 percent respectively when using Blanket Wash 6 instead of the baseline. Operators at both facilities commented that the alternative required more time to be absorbed into the press wipe, causing delays in the wash-up procedure. Performance results indicate an 11 percent increase and a 69 percent increase in cleaning times at facilities 11 and 15, respectively. Press operators at both facilities commented that Blanket Wash 6 cut well. Despite a 30 percent decrease in the average quantity of blanket wash used, facility 15 experienced a 60 percent increase in costs associated with blanket wash use (i.e., volume x price) due to a product cost of more than twice the baseline cost ($12.35/gallon for product 6 compared to $5.88/gallon for the baseline product). Facility 11 experienced a 20 percent increase in product use, with a subsequent increase of 170 percent in costs associated with product use.

Substitute Blanket Wash 9

Blanket washing costs increase significantly when using Blanket Wash 9 as compared to the baseline product at facilities 10 and 15. Both facilities rated the performance of product 9 as poor, indicating that its use requires excess time and effort. Costs increased 129 percent and 84 percent at facilities 10 and 15, respectively, when compared to the baseline. Performance data indicate that increased cleaning times are the driving force behind the cost increases experienced by both facilities. Cleaning times increase 175 percent and 129 percent when compared to the baseline at facilities 10 and 15, respectively. Facility 10 discontinued use of the alternative product 9 after four washes due to its poor performance.

Substitute Blanket Wash 10

Performance data indicate mixed results in the performance of Blanket Wash 10. Blanket washing costs increased 4 percent at facility 3 and 160 percent at facility 4 when Blanket Wash 10 is used rather than the baseline. Although the performance data indicate a small increase in cost at facility 3, the press operator's comments describe difficulty in getting the blanket wash to absorb into the application shop towel. The press operator at facility 4 had similar difficulties. After washing four blankets, the press operators at both facilities 3 and 4 discontinued use of the product.

Substitute Blanket Wash 11

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 11 instead of the baseline. Overall costs per wash at facilities 1 and 2 increased roughly 120 percent and 30 percent, respectively, when using Blanket Wash 11 instead of the baseline. Costs associated with product use (i.e., volume x price) are driven by the higher

price of Blanket Wash 11 as compared to the baseline. Blanket Wash 11 is priced at $12.15/gallon compared to $5.88/gallon for the baseline product. Both press operators indicate that a dry shop towel was required to clear the oily residue left by Blanket Wash 11. Material costs (i.e., press wipes) increased by roughly 210 percent and 140 percent at facility 1 and 2, respectively. Press operators at both facilities indicated that Blanket Wash 11 cut the ink well in the case of light or medium ink coverage but was not effective when ink coverage was heavy.

Substitute Blanket Wash 12

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 12 instead of the baseline. Average costs per wash increased roughly 20 percent and 5 percent at facilities 12 and 13, respectively. Facility 12 experienced difficulty with Blanket Wash 12 in cutting through paper residue and discontinued use of the wash on paper residue coated blankets. Facility 13 experimented with a variety of dilution ratios and found that the undiluted product worked best, outperforming both the baseline as well as their standard wash. At a cost of $16.40/gallon, however, Blanket Wash 12 would not be economically competitive with the baseline ($5.88/gallon) unless the average quantity used was significantly lower.

Substitute Blanket Wash 14

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 14 instead of the baseline product at both facilities 6 and 16. Compared to the baseline, total costs per wash increased 133 percent at facility 6 and 24 percent at facility 16. The average cleaning time increased significantly at facility 6 compared to the baseline, requiring an additional minute per wash. Despite a decrease in the average cleaning time, overall costs per wash at facility 16 increase, driven primarily by the product's higher price. Blanket Wash 14 is priced at $9.55/gallon compared to $5.88/gallon for the baseline. The press operator at facility 6 commented that Blanket Wash 14 cut the ink well, however, the press operator at facility 16 commented that Blanket Wash 14 did not cut ink as well as the baseline.

Substitute Blanket Wash 19

The results of the performance data indicate an increased financial cost when using Blanket Wash 19 instead of the baseline at both facilities 18 and 19. Overall costs per wash increased roughly 170 percent and 70 percent at facilities 18 and 19, respectively. Press operators commented that cleaning and drying times were excessive, as reflected in the performance data; performance results indicate a 150 percent increase and a 60 percent increase in cleaning times at facilities 18 and 19, respectively.

Substitute Blanket Wash 20

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 20 instead of the baseline. Average costs per wash increased roughly 60 percent and 95 percent at facilities 11 and 12, respectively. Cleaning times at facility 11 increased from an average of 60 seconds for the baseline to an average of 100 seconds for Blanket Wash 20. The press operator at facility 11 cites two primary reasons for the higher cleaning times: 1) Blanket Wash 20 left an oily residue on the blanket requiring an additional cleaning step, and 2) the product's thick consistency resulted in additional delays as the press operator waited for the wash to soak into the shop towel. After three trials, the press operator at facility 12 began to experience nausea and dizziness and discontinued use of the product. For this reason the contribution of labor to the product cost for Facility 12 is based on only one observation.

Substitute Blanket Wash 21

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 21 instead of the baseline. Costs per wash increase roughly 120 percent at facility 6 and 40 percent at facility 17 when compared to the baseline. Press operators at both test facilities comment that the alternative product left an oily residue on the blanket. Extra wiping was required to clear the blanket as reflected in the performance data --- when compared to the baseline, average cleaning times increased roughly 110 percent for facility 6 and 50 percent for facility 17. Press operators at both facilities commented that Blanket Wash 21 cut the ink well. The press operator at facility 6 discontinued use of Blanket Wash 21 after six washes because the oily residue began to affect subsequent runs.

Substitute Blanket Wash 22

Performance data indicate mixed results for Blanket Wash 22. Total costs per wash increased 89 percent for facility 13, but increased only 1 percent for facility 12. Despite a 34 percent decrease in the average quantity used, costs associated with product use (i.e., volume x price) increased 50 percent for facility 12. Blanket Wash 22 is priced at $13.15/gallon compared to a price of $5.88/gallon for the baseline product. The press operator at facility 13 commented that Blanket Wash 22 cuts the ink as well as the baseline, but its thick consistency resulted in delays during wash application and drying. Average cleaning time increased 67 percent at facility 13 compared to the baseline. The press operator at facility 12 commented that Blanket Wash 22 cut the ink well and performed better than the baseline wash.

Substitute Blanket Wash 24

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 24 instead of the baseline. Costs per wash increased roughly 50 percent at facility 16 and 110 percent at facility 17, when compared to the baseline. Press operators at both facilities commented that Blanket Wash 24 cut the ink well, however, it left an oily residue on the blanket and did not readily absorb into the press wipe. When compared to the baseline, average cleaning times increased 18 percent and 160 percent for facilities 16 and 17, respectively. Despite the fact that facility 17 used a smaller average quantity of Blanket Wash 24 compared to the baseline, the costs associated with blanket wash use (i.e., volume x price) increased due to a much higher price per gallon. The manufacturers price for product 24 is $17.85/gallon versus $5.88/gallon for the baseline product. Costs associated with product use (i.e., volume x price) increased roughly 220 percent and 160 percent for facilities 16 and 17, respectively.

Substitute Blanket Wash 26

Performance data indicate mixed results for Blanket Wash 26. Total costs per wash increased roughly 30 percent for facility 5, but decreased 6 percent at facility 15. Press operators at both facilities rated the performance of Blanket Wash 26 as good on the good-fair-poor scale for every one of its trials. Despite the fact that Blanket Wash 26 is priced higher than the baseline wash, differences in costs associated with product use (i.e., volume x price) did not contribute to the higher overall cost per wash at facility 5. Blanket Wash 26 is priced at $12.24/gallon compared to a price of $5.88/gallon for the baseline. Performance data indicate that the average quantity of blanket wash used at both facilities decreased by roughly 40 percent compared to the baseline. The savings experienced by facility 26 result from a 14 percent decrease in cleaning time compared to the baseline.

Substitute Blanket Wash 29

Using Blanket Wash 29 rather than the baseline, costs per press increased roughly 60 percent at both facilities 7 and 8. Blanket Wash 29 is priced three-times higher than the baseline, contributing significantly to the higher overall costs associated with its use. Costs associated with product use (i.e., volume x price) increase 300 percent and 230 percent at facilities 7 and 8 respectively due primarily to the products higher price. Blanket Wash 29 is priced at $18.00/gallon compared to a price of $5.88/gallon for the baseline. In addition, average cleaning times are higher for Blanket Wash 29 compared to the baseline for both facilities. Cleaning times increased 22 percent for facility 7 and 64 percent for facility 8.

Substitute Blanket Wash 30

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 30 instead of the baseline. Compared to the baseline, costs per wash increased roughly 60 percent at facility 18 and 20 percent at facility 19. Increased cleaning time was the primary contributor to the higher cost per wash for both facilities. According to the performance data, cleaning times at facility 18 increased from an average of 48 seconds for the baseline to an average of 82 seconds for Blanket Wash 30; however, this alternative was only tested under heavy ink coverage conditions and the baseline wash was observed under light and medium coverage conditions. The press operator at facility 19 commented that Blanket Wash 30 evaporated slowly; cleaning times for the alternative increased by roughly 30 percent, compared to the baseline. Press operators at both facilities commented that Blanket Wash 30 cut the ink well.

Substitute Blanket Wash 31

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 31 instead of the baseline. Compared to the baseline, costs per wash increased roughly 180 percent at facility 7 and 7 percent at facility 8. The press operator at facility 7 observed that drying times for Blanket Wash 31 were greater than the baseline; cleaning times averaged 140 seconds for Blanket Wash 31, compared to 45 seconds for the baseline product. The press operator at facility 8 experienced a decrease in cleaning time, but an increase in the quantity of blanket wash used. According to the performance data, cleaning times at facility 8 decreased by 4 percent compared to the baseline. The average quantity of blanket wash used, however, increases roughly 60 percent, off-setting the gains in labor savings. Press operators at both facilities indicated that Blanket Wash 31 cut the ink well.

Substitute Blanket Wash 32

Performance data indicate mixed results in the performance of Blanket Wash 32. Total costs per wash increased roughly 120 percent at facility 1, but decreased 20 percent at facility 5. Material costs (i.e., press wipes) contributed significantly to the higher costs per wash observed at facility 1. Costs associated with material use increased roughly 160 percent compared to the baseline. After eight blanket cleanings, facility 1 discontinued use of Blanket Wash 32 because an oily-residue remained on the blanket affecting subsequent print quality. Facility 5 reported lower cleaning times and reduced blanket wash use for Blanket Wash 32, compared to the baseline. Performance results indicate a 15 percent decrease in cleaning time and a 60 percent decrease in the quantity of blanket wash used for facility 5.

Substitute Blanket Wash 34

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 34 instead of the baseline; average costs per wash increased roughly 50

percent and 80 percent at facilities 1 and 19, respectively. Performance data indicate that costs associated with product use (i.e., volume x price) at facility 1 increased roughly 160 percent; however, the press operator at facility 1 rated the performance of Blanket Wash 34 as good on the good-fair-poor scale. This increase is completely attributable to the alternative product's higher price. Blanket Wash 34 is priced at $15/gallon compared to a price of $5.88/gallon for the baseline. The press operator at facility 19 commented that Blanket Wash 34 leaves a light residue on the blanket and does not readily soak into the press wipe. At facility 19, increased cleaning time is the single largest contributor to the higher average cost per wash of Blanket Wash 34; cleaning times averaged 67 seconds for Blanket Wash 31, compared to 41 seconds for the baseline product.

Substitute Blanket Wash 37

Performance data indicate a reduced financial cost when using Blanket Wash 37 instead of the baseline. Average costs per wash decreased roughly 13 percent and 7 percent at facilities 3 and 4, respectively. Overall costs per wash decreased due to reduced cleaning time and material use (i.e., press wipes). Compared to the baseline, cleaning times decreased roughly 20 percent at both facilities 3 and 4. After several days of usage, however, facility 4 discontinued use of Blanket Wash 37 because it caused uncoated paper to stick to the blankets.

Substitute Blanket Wash 38

Performance data indicate an increased financial cost when using Blanket Wash 38 instead of the baseline. Average costs per wash increased roughly 100 percent at facility 2 and 30 percent at facility 4. Costs associated with product use (i.e., volume x price) contributed significantly to the higher overall costs of using Blanket Wash 38. Specifically, compared to the baseline, costs associated with blanket wash use increased 400 percent at facility 2 and roughly 260 percent at facility 4 due primarily to Blanket Wash 38's high price. Blanket Wash 38 is priced at $19.00/gallon compared to $5.88/gallon for the baseline. Press operators at both facilities commented that Blanket Wash 38 left an oily-residue on the blanket with subsequent affects on print quality. Facility 2 discontinued use of the alternative after 1-1/2 days of use and facility 4 discontinued use of the product after six trials.

Substitute Blanket Wash 39

The results of the performance demonstration indicate an increased financial cost when using Blanket Wash 39 instead of the baseline. Costs at facilities 5 and 8 increased roughly 25 percent and 45 percent respectively when using Blanket Wash 39 instead of the baseline. Operators at both facilities commented that the alternative left an oily residue on the blanket, although no effect was noticed on print quality. Performance results indicated roughly a 40 percent increase in cleaning time at both facilities 5 and 8. Despite a 30 percent decrease in the average quantity of blanket wash used, the costs associated with product use (i.e., volume x price) did not vary between Blanket Wash 39 and the baseline. The manufacturer's price for product 39 is $12.35/gallon compared to $5.88/gallon for the baseline product.

Substitute Blanket Wash 40

Performance data indicate mixed results in the performance of Blanket Wash 40. Compared to the baseline, average costs increased roughly 35 percent at facility 1 but decreased 4 percent at facility 10. The higher cost experienced by facility 1 is attributable to Blanket Wash 40's higher price as well as an increase in the average number of press wipes used. The average quantity of blanket wash used by facility 1 is 2.5 ounces for both the alternative as well as the baseline; however, costs associated with blanket wash use (i.e., volume x price) increased roughly 80 percent due to Blanket Wash 40's higher price. The reduced costs experienced by facility 10 are

attributable to a reduction in the average quantity of blanket wash used. Costs associated with product use decreased roughly 30 percent for facility 10. Press operators at both facilities commented that Blanket Wash 40 cut the ink well.

Summary of Cost Analysis for Blanket Wash 1

		Facility 3				Facility 6			
Facility Characteristics									
Press size		18" x 25"				18" x 25"			
Average ink coverage		Medium-Heavy				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 3				**Facility 6**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	37.5 (n=4)	+7.5	+25	30 (n=1)	51 (n=4)	+21	+70
	Cost ($)	0.28	0.35	+0.07	+25	0.28	0.47	+0.19	+70
Blanket Wash Use[2]	Average Quantity (oz.)	1.00 (n=1)	1.04 (n=14)	+0.04	+4	1.5 (n=1)	1.14 (n=8)	-0.36	-24
	Post Dilution Cost ($)	0.05	0.16	+0.11	+220	0.07	0.18	+0.11	+157
Materials and Equipment[2]	# wipes	2.0 (n=1)	1.6 (n=14)	-0.4	-20	1.0 (n=1)	2.0 (n=8)	+1.0	+100
	Cost ($)	0.22	0.18	-0.04	-18	0.11	0.22	+0.11	+100
Totals									
Total cost/wash ($)		0.55	0.69	+0.14	+25	0.46	0.87	+0.41	+89
Total cost/press[3] ($)		2.20	2.76	+0.56	+25	1.84	3.48	+1.64	+89
Total cost/press/ shift/year[4] ($)		5,500	6,900	+1,400	+25	4,600	8,700	+4,100	+89

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 6

		Facility 11				Facility 15			
Facility Characteristics									
Press size		19" x 26"				19" x 25"			
Average ink coverage		Medium-Heavy				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 11				**Facility 15**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	61 (n=4)	68 (n=8)	+7	+11	35 (n=2)	59 (n=4)	+24	+69
	Cost ($)	0.56	0.63	+0.07	+11	0.32	0.54	+0.22	+69
Blanket Wash Use[2]	Average Quantity (oz.)	0.73 (n=4)	0.88 (n=19)	+0.15	+21	1.5 (n=2)	1.1 (n=27)	-0.4	-27
	Post Dilution Cost ($)	0.03	0.08	+0.05	+167	0.07	0.11	+0.04	+57
Materials and Equipment[2]	# wipes	1.0 (n=4)	1.0 (n=19)	0	0	1.0 (n=2)	1.1 (n=27)	+0.1	+10
	Cost ($)	0.11	0.11	0	0	0.11	0.12	+0.01	+9
Totals									
Total cost/wash ($)		0.70	0.82	+0.12	+17	0.50	0.77	+0.27	+54
Total cost/press[3] ($)		2.80	3.28	+0.48	+17	2.00	3.08	+1.08	+54
Total cost/press/shift/year[4] ($)		7,000	8,200	+1,200	+17	5,000	7,700	+2,700	+54

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 9

		Facility 10				Facility 15			
Facility Characteristics									
Press size		19" x 28"				19" x 25"			
Average ink coverage		Medium				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 10				Facility 15			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	60 (n=1)	165 (n=4)	+105	+175	35 (n=2)	80 (n=3)	+45	+129
	Cost ($)	0.55	1.52	+0.97	+175	0.32	0.74	+0.42	+129
Blanket Wash Use[2]	Average Quantity (oz.)	3.0 (n=1)	3.1 (n=4)	+0.1	+3	1.5 (n=2)	0.86 (n=24)	-0.64	-43
	Post Dilution Cost ($)	0.14	0.25	+0.11	+79	0.07	0.07	0	0
Materials and Equipment[2]	# wipes	2.0 (n=1)	2.8 (n=4)	+0.8	+40	1.0 (n=2)	1.0 (n=23)	0	0
	Cost ($)	0.22	0.31	+0.09	+41	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.91	2.08	+1.17	+129	0.50	0.92	+0.42	+84
Total cost/press[3] ($)		3.64	8.32	+4.68	+129	2.00	3.68	+1.68	+84
Total cost/press/shift/year[4] ($)		9,100	20,800	+11,700	+129	5,000	9,200	+4,200	+84

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 10

		Facility 3				Facility 4			
Facility Characteristics									
Press size		18" x 25"				40" x 34"			
Average ink coverage		Medium				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 3				Facility 4			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	30 (n=4)	0	0	53 (n=2)	203 (n=4)	+150	+282
	Cost ($)	0.28	0.28	0	0	0.49	1.87	+1.38	+282
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	1.0 (n=4)	0	0	3.0 (n=2)	3.0 (n=4)	0	0
	Post Dilution Cost ($)	0.05	0.07	+0.02	+40	0.14	0.22	+0.08	+57
Materials and Equipment[2]	# wipes	2.0 (n=1)	2.0 (n=4)	0	0	2.0 (n=2)	1.0 (n=1)	-1	-50
	Cost ($)	0.22	0.22	0	0	0.22	0.11	-0.11	-50
Totals									
Total cost/wash ($)		0.55	0.57	+0.02	+4	0.85	2.20	+1.35	+159
Total cost/press[3] ($)		2.20	2.28	+0.08	+4	3.40	8.80	+5.40	+159
Total cost/press/shift/year[4] ($)		5,500	5,700	+200	+4	8,500	22,000	+13,500	+159

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.
[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.
[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.
[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 11

		Facility 1				Facility 2			
Facility Characteristics									
Press size		40" x 28"				13" x 18"			
Average ink coverage		Medium				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 1				Facility 2			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	40 (n=2)	76 (n=7)	+36	+89	40 (n=3)	30 (n=2)	-10	-25
	Cost ($)	0.37	0.70	+0.33	+89	0.37	0.28	-0.09	-25
Blanket Wash Use[2]	Average Quantity (oz.)	2.50 (n=2)	2.61 (n=33)	+0.11	+4	1.17 (n=3)	1.44 (n=33)	+0.27	+23
	Post Dilution Cost ($)	0.11	0.25	+0.14	+127	0.05	0.14	+0.09	+180
Materials and Equipment[2]	# wipes	1.0 (n=2)	3.1 (n=33)	+2.1	+210	1.0 (n=3)	2.4 (n=33)	+1.4	+140
	Cost ($)	0.11	0.34	+0.23	+209	0.11	0.26	+0.15	+136
Totals									
Total cost/wash ($)		0.59	1.29	+0.70	+119	0.53	0.68	+0.15	+28
Total cost/press[3] ($)		2.36	5.16	+2.80	+119	2.12	2.72	+0.60	+28
Total cost/press/shift/year[4] ($)		5,900	12,900	+7,000	+119	5,300	6,800	+1,500	+28

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 12

		Facility 12				Facility 13			
Facility Characteristics									
Press size		28" x 40"				20" x 26"			
Average ink coverage		Medium				Medium			
Dilution ratio (water:wash)		1:1				1:1			
Cost Element per Blanket Wash									
		Facility 12				**Facility 13**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	44 (n=6)	48 (n=5)	+4	+9	60 (n=3)	62.5 (n=4)	+2.5	+4
	Cost ($)	0.41	0.44	+0.03	+9	0.55	0.58	+0.03	+4
Blanket Wash Use[2]	Average Quantity (oz.)	4.42 (n=6)	2.54 (n=28)	-1.88	-43	2.33 (n=3)	0.86 (n=23)	-1.47	-63
	Post Dilution Cost ($)	0.20	0.32	+0.12	+60	0.11	0.11	0	0
Materials and Equipment[2]	# wipes	1.8 (n=6)	2.1 (n=27)	+0.3	+17	1.3 (n=3)	1.3 (n=23)	0	0
	Cost ($)	0.20	0.23	+0.03	+15	0.14	0.14	0	0
Totals									
Total cost/wash ($)		0.81	0.99	+0.18	+22	0.80	0.83	+0.03	+4
Total cost/press[3] ($)		3.24	3.96	+0.72	+22	3.20	3.32	+0.12	+4
Total cost/press/shift/year[4] ($)		8,100	9,900	+1,800	+22	8,000	8,300	+300	+4

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 14

		Facility 6				Facility 16			
Facility Characteristics									
Press size		18" x 25"				20" x 26"			
Average ink coverage		Medium				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 6				Facility 16			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	90 (n=3)	+60	+200	50 (n=2)	42 (n=6)	-8	-16
	Cost ($)	0.28	0.83	+0.55	+200	0.46	0.39	-0.07	-16
Blanket Wash Use[2]	Average Quantity (oz.)	1.50 (n=1)	1.25 (n=18)	-0.25	-17	2 (n=2)	2.8 (n=40)	+0.8	+40
	Post Dilution Cost ($)	0.07	0.09	+0.02	+29	0.09	0.21	+0.12	+133
Materials and Equipment[2]	# wipes	1.0 (n=1)	1.3 (n=18)	+0.3	+30	1.0 (n=2)	2.0 (n=40)	+1.0	+100
	Cost ($)	0.11	0.15	+0.04	+36	0.11	0.22	+0.11	+100
Totals									
Total cost/wash ($)		0.46	1.07	+0.61	+133	0.66	0.82	+0.16	+24
Total cost/press[3] ($)		1.84	4.28	+2.44	+133	2.64	3.28	+0.64	+24
Total cost/press/shift/year[4] ($)		4,600	10,700	+6,100	+133	6,600	8,200	+1,600	+24

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 19

		Facility 18				Facility 19			
Facility Characteristics									
Press size		19" x 26"				19" x 26"			
Average ink coverage		Medium-Heavy				Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 18				**Facility 19**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	48 (n=6)	118 (n=5)	+70	+146	41 (n=5)	66 (n=8)	+25	+61
	Cost ($)	0.44	1.09	+0.65	+146	0.38	0.61	+0.23	+61
Blanket Wash Use[2]	Average Quantity (oz.)	1.5 (n=6)	3.0 (n=10)	+1.5	+100	0.9 (n=5)	1.7 (n=16)	+0.8	+89
	Post Dilution Cost ($)	0.07	0.28	+0.21	+300	0.04	0.16	+0.12	+300
Materials and Equipment[2]	# wipes	1.0 (n=6)	2.6 (n=10)	+1.6	+160	1.0 (n=5)	1.1 (n=16)	+0.1	+10
	Cost ($)	0.11	0.29	+0.18	+164	0.11	0.12	+0.01	+9
Totals									
Total cost/wash ($)		0.62	1.66	+1.04	+168	0.53	0.89	+0.36	+68
Total cost/press[3] ($)		2.48	6.64	+4.16	+168	2.12	3.56	+1.44	+68
Total cost/press/shift/year[4] ($)		6,200	16,600	+10,400	+168	5,300	8,900	+3,600	+68

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 20

		Facility 11				Facility 12			
Facility Characteristics									
Press size		19" x 26"				28" x 40"			
Average ink coverage		Medium-Heavy				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 11				Facility 12			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	61 (n=4)	96 (n=7)	+35	+57	44 (n=6)	120 (n=1)	+76	+173
	Cost ($)	0.56	0.88	+0.32	+57	0.41	1.11	+0.70	+173
Blanket Wash Use[2]	Average Quantity (oz.)	0.7 (n=4)	1.3 (n=24)	+0.6	+86	4.4 (n=6)	3.0 (n=1)	-1.4	-32
	Post Dilution Cost ($)	0.03	0.11	+0.08	+267	0.20	0.25	+0.05	+25
Materials and Equipment[2]	# wipes	1.0 (n=4)	1.3 (n=24)	+0.3	+30	1.8 (n=6)	2.0 (n=1)	+0.2	+11
	Cost ($)	0.11	0.14	+0.03	+27	0.20	0.22	+0.02	+10
Totals									
Total cost/wash ($)		0.70	1.13	+0.43	+61	0.81	1.58	+0.77	+95
Total cost/press[3] ($)		2.80	4.52	+1.72	+61	3.24	6.32	+3.08	+95
Total cost/press/shift/year[4] ($)		7,000	11,300	+4,300	+61	8,100	15,800	+7,700	+95

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 21

		Facility 6				Facility 17			
Facility Characteristics									
Press size		18" x 25"				19" x 26"			
Average ink coverage		Medium				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 6				Facility 17			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	62 (n=5)	+32	+107	25 (n=5)	38 (n=9)	+13	+52
	Cost ($)	0.28	0.57	+0.29	+107	0.23	0.35	+0.12	+52
Blanket Wash Use[2]	Average Quantity (oz.)	1.5 (n=1)	2.0 (n=6)	+0.5	+33	1.5 (n=5)	1.4 (n=34)	-0.1	-7
	Post Dilution Cost ($)	0.07	0.16	+0.09	+129	0.07	0.11	+0.04	+57
Materials and Equipment[2]	# wipes	1.0 (n=1)	2.5 (n=6)	+1.5	+150	1.0 (n=5)	1.1 (n=34)	+0.1	+10
	Cost ($)	0.11	0.28	+0.17	+155	0.11	0.12	+0.01	+9
Totals									
Total cost/wash ($)		0.46	1.01	+0.55	+120	0.41	0.58	+0.17	+41
Total cost/press[3] ($)		1.84	4.04	+2.20	+120	1.64	2.32	+0.68	+41
Total cost/press/shift/year[4] ($)		4,600	10,100	+5,500	+120	4,100	5,800	+1,700	+41

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 22

		Facility 12				Facility 13			
Facility Characteristics									
Press size		28" x 40"				20" x 26"			
Average ink coverage		Medium-Heavy				Medium			
Dilution ratio (water:wash)		1:4				1:4			
Cost Element per Blanket Wash									
		Facility 12				**Facility 13**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	44 (n=6)	28 (n=4)	-16	-36	60 (n=3)	100 (n=3)	+40	+67
	Cost ($)	0.41	0.26	-0.15	-36	0.55	0.92	+0.37	+67
Blanket Wash Use[2]	Average Quantity (oz.)	4.4 (n=6)	2.9 (n=13)	-1.5	-34	2.3 (n=3)	2.7 (n=20)	+0.4	+17
	Post Dilution Cost ($)	0.20	0.30	+0.10	+50	0.11	0.28	+0.17	+155
Materials and Equipment[2]	# wipes	1.8 (n=6)	2.4 (n=12)	+0.6	+33	1.3 (n=3)	2.8 (n=20)	+1.5	+115
	Cost ($)	0.20	0.26	+0.06	+30	0.14	0.31	+0.17	+121
Totals									
Total cost/wash ($)		0.81	0.82	+0.01	+1	0.80	1.51	+0.71	+89
Total cost/press[3] ($)		3.24	3.28	+0.04	+1	3.20	6.04	+2.84	+89
Total cost/press/shift/year[4] ($)		8,100	8,200	+100	+1	8,000	15,100	+7,100	+89

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 24

		Facility 16				Facility 17			
Facility Characteristics									
Press size		20" x 26"				19" x 26"			
Average ink coverage		Heavy				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 16				Facility 17			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	50 (n=2)	59 (n=7)	+9	+18	25 (n=5)	64 (n=4)	+39	+156
	Cost ($)	0.46	0.54	+0.08	+18	0.23	0.59	+0.36	+156
Blanket Wash Use[2]	Average Quantity (oz.)	2 (n=2)	2.06 (n=35)	+0.06	+3	1.5 (n=5)	1.3 (n=4)	-0.2	-13
	Post Dilution Cost ($)	0.09	0.29	+0.20	+222	0.07	0.18	+0.11	+157
Materials and Equipment[2]	# wipes	1 (n=2)	1.3 (n=34)	+0.3	+30	1.0 (n=5)	1.0 (n=3)	0	0
	Cost ($)	0.11	0.14	+0.03	+27	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.66	0.97	+0.31	+47	0.41	0.88	+0.47	+115
Total cost/press[3] ($)		2.64	3.88	+1.24	+47	1.64	3.52	+1.88	+115
Total cost/press/shift/year[4] ($)		6,600	9,700	+3,100	+47	4,100	8,800	+4,700	+115

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 26

		Facility 5				Facility 15			
Facility Characteristics									
Press size		12" x 18"				19" x 25"			
Average ink coverage		Medium				Medium-Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 5				Facility 15			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	60 (n=4)	+30	+100	35 (n=2)	30 (n=3)	-5	-14
	Cost ($)	0.28	0.55	+0.27	+100	0.32	0.28	-0.04	-14
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	0.56 (n=18)	-0.44	-44	1.50 (n=2)	0.85 (n=25)	-0.65	-43
	Post Dilution Cost ($)	0.05	0.05	0	0	0.07	0.08	+0.01	+14
Materials and Equipment[2]	# wipes	2.0 (n=1)	1.2 (n=18)	-0.8	-40	1.0 (n=2)	1.0 (n=25)	0	0
	Cost ($)	0.22	0.13	-0.07	-32	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.55	0.73	+0.18	+33	0.50	0.47	-0.03	-6
Total cost/press[3] ($)		2.20	2.92	+0.72	+33	2.00	1.88	-0.12	-6
Total cost/press/shift/year[4] ($)		5,500	7,300	+1,800	+33	5,000	4,700	-300	-6

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 29

		Facility 7				Facility 8			
Facility Characteristics									
Press size		20" x 26"				20" x 26"			
Average ink coverage		Medium				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 7				**Facility 8**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	45 (n=1)	55 (n=4)	+10	+22	45 (n=4)	74 (n=14)	+29	+64
	Cost ($)	0.41	0.51	+0.10	+22	0.41	0.68	+0.27	+64
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	1.4 (n=8)	+0.4	+40	0.7 (n=4)	0.7 (n=50)	0	0
	Post Dilution Cost ($)	0.05	0.20	+0.15	+300	0.03	0.10	+0.07	+233
Materials and Equipment[2]	# wipes	1.0 (n=1)	2.0 (n=5)	+1.0	+100	1.0 (n=4)	1.0 (n=50)	0	0
	Cost ($)	0.11	0.22	+0.11	+100	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.57	0.93	+0.36	+63	0.55	0.89	+0.34	+62
Total cost/press[3] ($)		2.28	3.72	+1.44	+63	2.20	3.56	+1.36	+62
Total cost/press/shift/year[4] ($)		5,700	9,300	+3,600	+63	5,500	8,900	+3,400	+62

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 30

		Facility 18				Facility 19			
Facility Characteristics									
Press size		19" x 26"				19" x 26"			
Average ink coverage		Medium				Heavy			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 18				Facility 19			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	48 (n=6)	82 (n=3)	+34	+71	41 (n=5)	52 (n=6)	+11	+26
	Cost ($)	0.44	0.76	+0.32	+71	0.38	0.48	+0.10	+26
Blanket Wash Use[2]	Average Quantity (oz.)	1.53 (n=6)	2.95 (n=6)	+1.42	+93	0.88 (n=5)	0.74 (n=14)	-0.14	-16
	Post Dilution Cost ($)	0.07	0.12	+0.05	+171	0.04	0.03	-0.01	-25
Materials and Equipment[2]	# wipes	1.0 (n=6)	1.2 (n=6)	+0.2	+20	1.0 (n=5)	1.0 (n=14)	0	0
	Cost ($)	0.11	0.13	0.02	+18	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.62	1.01	+0.39	+63	0.53	0.62	+0.09	+17
Total cost/press[3] ($)		2.48	4.04	+1.56	+63	2.12	2.48	+0.36	+17
Total cost/press/shift/year[4] ($)		6,200	10,100	+3,900	+63	5,300	6,200	+900	+17

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 31

		Facility 7				Facility 8			
Facility Characteristics									
Press size		20" x 26"				20" x 26"			
Average ink coverage		Medium				Light-Medium			
Dilution rate (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 7				Facility 8			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	45 (n=1)	140 (n=3)	+95	+211	45 (n=4)	43 (n=4)	-2	-4
	Cost ($)	0.41	1.29	+0.88	+21	0.41	0.40	-0.01	-4
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	1.0 (n=3)	0	0	0.7 (n=4)	1.1 (n=65)	+0.4	+57
	Post Dilution Cost ($)	0.05	0.08	+0.03	+60	0.03	0.08	+0.05	+167
Materials and Equipment[2]	# wipes	1.0 (n=1)	2.0 (n=2)	+1.0	+100	1.0 (n=4)	1.0 (n=65)	0	0
	Cost ($)	0.11	0.22	+0.11	+100	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.57	1.59	+1.02	+179	0.55	0.59	+0.04	+7
Total cost/press[3] ($)		2.28	6.36	+4.08	+179	2.20	2.36	+0.16	+7
Total cost/press/shift/year[4] ($)		5,700	15,900	+10,200	+179	5,500	5,900	+400	+7

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 32

		Facility 1				Facility 5			
Facility Characteristics									
Press size		40" x 28"				12" x 18"			
Average ink coverage		Medium				Medium			
Dilution rate (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 1				Facility 5			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	40 (n=2)	105 (n=4)	+70	+162	40 (n=3)	34 (n=4)	-6	-15
	Cost ($)	0.37	0.97	+0.6	+162	0.37	0.31	-0.06	-15
Blanket Wash Use[2]	Average Quantity (oz.)	2.5 (n=2)	2.5 (n=8)	0	0	1.17 (n=3)	0.63 (n=16)	-0.67	-57
	Post Dilution Cost ($)	0.11	0.06	-0.05	-45	0.05	0.01	-0.04	-80
Materials and Equipment[2]	# wipes	1.0 (n=2)	2.5 (n=8)	+1.5	+150	1.0 (n=3)	1.0 (n=13)	0	0
	Cost ($)	0.11	0.28	+0.17	+155	0.11	0.11	0	0
Totals									
Total cost/wash ($)		0.59	1.31	+0.72	+122	0.53	0.43	-0.10	-19
Total cost/press[3] ($)		2.36	5.24	+2.88	+122	2.12	1.72	-0.40	-19
Total cost/press/shift/year[4] ($)		5,900	13,100	+7,200	+122	5,300	4,300	-1,000	-19

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 34

		Facility 1				Facility 19			
Facility Characteristics									
Press size		40" x 28"				19" x 26"			
Average ink coverage		Medium				Medium			
Dilution rate (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 1				**Facility 19**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor	Time spent cleaning (sec.)[2]	40 (n=2)	40 (n=4)	0	0	41 (n=5)	67 (n=13)	+26	+63
	Cost ($)	0.37	0.37	0	0	0.38	0.62	+0.24	+63
Blanket Wash Use	Average Quantity (oz.)	2.5 (n=2)	2.5 (n=41)	0	0	0.88 (n=5)	1.23 (n=13)	+0.35	+40
	Post Dilution Cost ($)	0.11	0.29	+0.18	+164	0.04	0.14	+0.10	+250
Materials and Equipment	# wipes	1.0 (n=2)	2.1 (n=41)	+1.1	+110	1.0 (n=5)	1.8 (n=13)	+0.8	+80
	Cost ($)	0.11	0.23	+0.12	+109	0.11	0.19	+0.08	+73
Totals									
Total cost/wash ($)		0.59	0.89	+0.3	+51	0.53	0.95	+0.42	+79
Total cost/press[3] ($)		2.36	3.56	+1.20	+51	2.12	3.80	+1.68	+79
Total cost/press/shift/year[4] ($)		5,900	8,900	+3,000	+51	5,300	9,500	+4,200	+79

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 37

		Facility 3				Facility 4			
Facility Characteristics									
Press size		18" x 25"				40" x 34"			
Average ink coverage		Medium-Heavy				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 3				Facility 4			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	24 (n=5)	-6	-20	53 (n=2)	42 (n=5)	-11	-21
	Cost ($)	0.28	0.22	-0.06	-20	0.49	0.39	-0.10	-21
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	1.16 (n=22)	+0.16	+16	3.0 (n=2)	2.14 (n=11)	-0.86	-29
	Post Dilution Cost ($)	0.05	0.13	+0.08	+160	0.14	0.25	+0.11	+79
Materials and Equipment[2]	# wipes	2.0 (n=1)	1.2 (n=22)	-0.8	-40	2.0 (n=2)	1.4 (n=8)	-0.6	-30
	Cost ($)	0.22	0.13	-0.09	-41	0.22	0.15	-0.07	-32
Totals									
Total cost/wash ($)		0.55	0.48	-0.07	-13	0.85	0.79	-0.06	-7
Total cost/press[3] ($)		2.20	1.92	-0.28	-13	3.40	3.16	-0.24	-7
Total cost/press/shift/year[4] ($)		5,500	4,800	-700	-13	8,500	7,900	-600	-7

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 38

		Facility 2				Facility 4			
Facility Characteristics									
Press size		13" x 18"				40" x 34"			
Average ink coverage		Medium				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 2				Facility 4			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	40 (n=3)	65 (n=6)	+25	+62	53 (n=2)	45 (n=4)	-8	-15
	Cost ($)	0.37	0.60	+0.23	+62	0.49	0.41	-0.08	-15
Blanket Wash Use[2]	Average Quantity (oz.)	1.17 (n=3)	1.68 (n=15)	+0.51	+44	3.0 (n=2)	3.4 (n=10)	+0.4	+13
	Post Dilution Cost ($)	0.05	0.25	+0.20	+400	0.14	0.50	+0.36	+257
Materials and Equipment[2]	# wipes	1.0 (n=3)	2.1 (n=15)	+1.1	+110	2.0 (n=2)	1.8 (n=9)	-0.2	-10
	Cost ($)	0.11	0.23	+0.12	+109	0.22	0.20	-0.02	-9
Totals									
Total cost/wash ($)		0.53	1.08	+0.55	+104	0.85	1.11	+0.26	+31
Total cost/press[3] ($)		2.12	4.32	+2.20	+104	3.40	4.44	+1.04	+31
Total cost/press/shift/year[4] ($)		5,300	10,800	+5,500	+104	8,500	11,100	+2,600	+31

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 39

		Facility 5				Facility 8			
Facility Characteristics									
Press size		12" x 18"				20" x 26"			
Average ink coverage		Medium				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 5				**Facility 8**			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	30 (n=1)	43 (n=4)	+13	+43	45 (n=4)	63 (n=4)	+18	+40
	Cost ($)	0.28	0.40	+0.12	+43	0.41	0.58	+0.17	+40
Blanket Wash Use[2]	Average Quantity (oz.)	1.0 (n=1)	0.69 (n=36)	-0.31	-31	0.70 (n=4)	1.22 (n=9)	+0.52	+74
	Post Dilution Cost ($)	0.05	0.05	0	0	0.03	0.09	+0.06	+200
Materials and Equipment[2]	# wipes	2.0 (n=1)	2.2 (n=36)	+0.2	+10	1.0 (n=4)	1.2 (n=9)	+0.2	+20
	Cost ($)	0.22	0.24	+0.02	+9	0.11	0.13	+0.02	+18
Totals									
Total cost/wash ($)		0.55	0.69	+0.14	+25	0.55	0.80	+0.25	+45
Total cost/press[3] ($)		2.20	2.76	+0.56	+25	2.20	3.20	+1.00	+45
Total cost/press/shift/year[4] ($)		5,500	6,900	+1,400	+25	5,500	8,000	+2,500	+45

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.

Summary of Cost Analysis for Blanket Wash 40

		Facility 1				Facility 10			
Facility Characteristics									
Press size		40" x 28"				19" x 28"			
Average ink coverage		Light-Medium				Medium			
Dilution ratio (water:wash)		0				0			
Cost Element per Blanket Wash									
		Facility 1				Facility 10			
		Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]	Baseline Wash	Alternative Wash	Absolute Difference[1]	Percentage Difference[1]
Labor[2]	Time spent cleaning (sec.)	40 (n=2)	40 (n=4)	0	0	60 (n=1)	60 (n=5)	0	0
	Cost ($)	0.37	0.37	0	0	0.55	0.55	0	0
Blanket Wash Use[2]	Average Quantity (oz.)	2.5 (n=2)	2.5 (n=10)	0	0	3.0 (n=1)	1.2 (n=11)	-1.8	-60
	Post Dilution Cost ($)	0.11	0.20	+0.09	+82	0.14	0.10	-0.04	-29
Materials and Equipment[2]	# wipes	1.0 (n=2)	2.0 (n=10)	+1.0	+100	2.0 (n=1)	2.0 (n=10)	0	0
	Cost ($)	0.11	0.22	+0.11	+100	0.22	0.22	0	0
Totals									
Total cost/wash ($)		0.59	0.79	+0.20	+34	0.91	0.87	-0.04	-4
Total cost/press[3] ($)		2.36	3.16	+0.80	+34	3.64	3.48	-0.16	-4
Total cost/press/shift/year[4] ($)		5,900	7,900	+2,000	+34	9,100	8,700	-400	-4

[1] A positive sign denotes an increase and a negative sign denotes a decrease in the time, quantity, number of wipes, or cost when using the alternative blanket cleaner instead of the base product.

[2] "n" denotes the number of observations used in calculating average time, quantity, and number of wipes.

[3] Presses are assumed to have four units; therefore, four blankets are washed each time a press is cleaned.

[4] The following assumptions were made in generating a total cost/press/shift/year: 1) Each press is washed 10 times per shift, and 2) Work is performed in 8 hour shifts, 5 days per week and 50 weeks per year.